Improving MKID Performance at the UVOIR Wavelengths

Completed Technology Project (2017 - 2021)

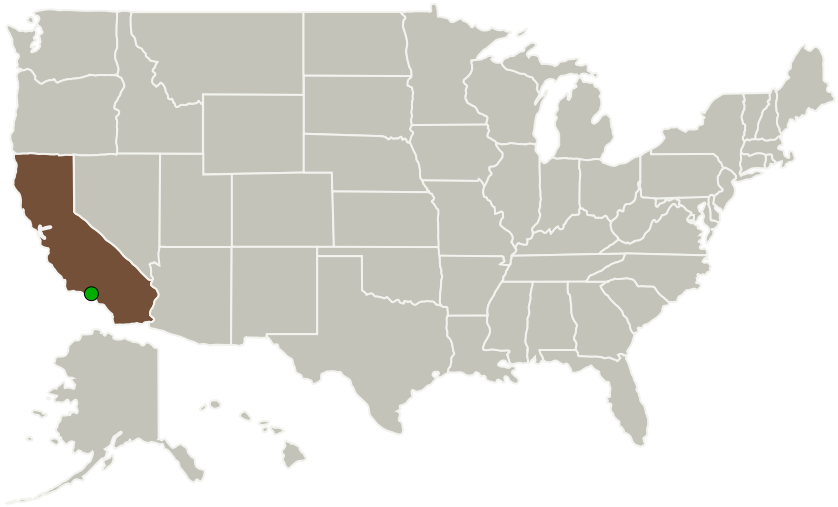
Project Introduction

Our understanding of exoplanets has advanced dramatically in the past two decades with the introduction of new planetary detection techniques. Most recently, the direct imaging approach has made possible the spectral characterization of planets orbiting nearby stars. This capability opens the door for detecting traces of life in their atmospheres and has been targeted as a major goal in NASA's 30-year strategic vision. Already many space-based telescopes have been proposed to accomplish this task. However, to characterize the atmosphere around a potential exo-earth, current detector performance must be improved. Microwave kinetic inductance detectors are one of the most promising new detectors that could meet this performance challenge in the ultraviolet to infrared spectrum. They have an advantage over other low temperature detector technologies as they are innately easy to multiplex and can be fabricated into large arrays. I propose to improve the MKID energy resolution and quantum efficiency so that these detectors will meet the specifications required for a space-based exoplanet spectroscopy mission.

Anticipated Benefits

This research will improve the MKID energy resolution and quantum efficiency so that these detectors will meet the specifications required for a space-based exoplanet spectroscopy mission. This capability opens the door for detecting traces of life on exoplanets.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
University of California-Santa Barbara(UCSB)	Lead Organization	Academia Asian American Native American Pacific Islander (AANAPISI), Hispanic Serving Institutions (HSI)	Santa Barbara, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Project Website:

https://www.nasa.gov/strg#.VQb6T0jJzyE

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

University of California-Santa Barbara (UCSB)

Responsible Program:

Space Technology Research Grants

Project Management

Program Director:

Claudia M Meyer

Program Manager:

Hung D Nguyen

Principal Investigator:

Benjamin A Mazin

Co-Investigator:

Nicholas R Zobrist

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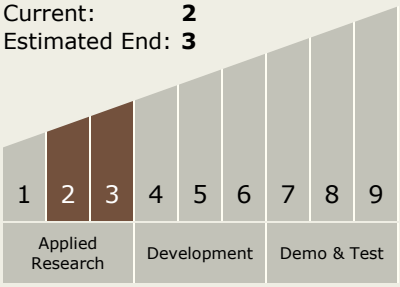
Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **3**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destination

Outside the Solar System